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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,092	06/24/2003	Daoqiang Lu	42.P16449	2530

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EXAMINER

COLEMAN, WILLIAM D

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,092

Applicant(s)

LU ET AL.

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

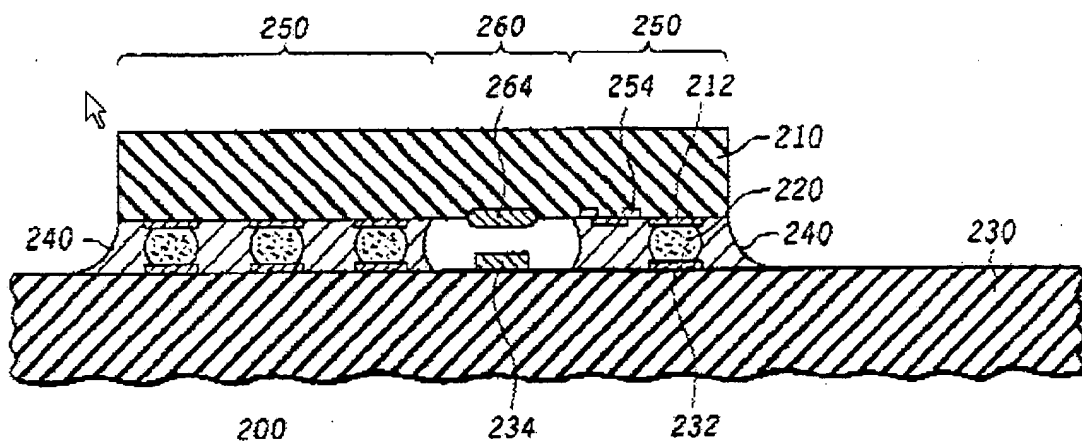
2. Claims 1, 2, 3, 4, 5, 9, 10, 11, 12, 14, 15, 16, 19, 20, 21, 22, 24, 25 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Chason et al., U.S. Patent Application Publication No. U.S. No. 2004/018599 A1.

Chason discloses a semiconductor apparatus as claimed. Please see **FIGS. 1-6** where Chason teaches the following limitations.

3. Pertaining to claim 1, Chason teaches an apparatus comprising:
an optical die flip-chip **210** bonded to a substrate **230** and defining a volume between the optical die and the substrate, the optical die including an optically active area **260** on a surface of the die facing the substrate;
an optically transparent material (air in this case) occupying at least those portions of the volume substantially corresponding with the optical path of the optically active area; and
an opaque underfill material **240** occupying portions of the volume not occupied by the optically transparent material [0036].

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4. Pertaining to claim 2, Chason teaches the apparatus of claim 1 wherein the optically active area is a detector or a source.



5. Pertaining to claim 3, Chason teaches the apparatus of claim 1 wherein the optically transparent material has a low modulus of elasticity (the Examiner takes the position that the term "low" is a very relative term and has no patentable weight).
6. Pertaining to claim 4, Chason teaches the apparatus of claim 1 wherein the optically transparent material is optically transparent at wavelengths between 800 nm and 1550 nm (please note that air is transparent at the claimed wavelengths).
7. Pertaining to claim 5, Chason teaches the apparatus of claim 4 wherein the optically transparent material is optically transparent at a wavelength of approximately 850 nm (see the rejection of claim 4 above).

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8. Pertaining to claim 7, Chason teaches the apparatus of claim 1 wherein the optically transparent material is an adhesive (Chason teaches the underfill material being transparent [0036]).

9. Pertaining to claim 8, Chason teaches the apparatus of claim 7 wherein the optically transparent material is silicone based (column 6, line 41).

10. Pertaining to claim 9, Chason teaches an apparatus comprising:
an optical die flip-chip bonded to a substrate and defining a volume between the optical die and the substrate, the optical die including an optically active area on a surface of the die facing the substrate;
an optical component partially positioned in the volume between the optical die and the substrate to carry an optical signal to or receive an optical signal from the optically active area;
an optically transparent material occupying those portions of the volume substantially in the optical path of the optically active area and the optical component; and
an opaque underfill material occupying portions of the volume not occupied by the optically transparent material and the optical component.

11. Pertaining to claim 10, Chason teaches the apparatus of claim 9 wherein the optical component is a waveguide.

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12. Pertaining to claim 11, Chason teaches the apparatus of claim 9 wherein the optically active area is a detector or a source.

13. Pertaining to claim 12, Chason teaches the apparatus of claim 9 wherein the optically transparent material has a refractive index substantially the same as a refractive index of the optical component.

14. Pertaining to claim 14, Chason teaches the apparatus of claim 9 wherein the optically transparent material has a low modulus of elasticity.

15. Pertaining to claim 15, Chason teaches the apparatus of claim 9 wherein the optically transparent material is optically transparent at wavelengths between 800 nm and 1550 nm.

16. Pertaining to claim 16, Chason teaches the apparatus of claim 15 wherein the optically transparent material is optically transparent at a wavelength of approximately 850 nm.

17. Pertaining to claim 7, Chason teaches the apparatus of claim 9 wherein the optically transparent material is an adhesive.

18. Pertaining to claim 18, Chason teaches the apparatus of claim 9 wherein the optically transparent material is silicone-based.

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19. Pertaining to claim 19, Chason teaches a system comprising:

a signal source;

a first optical die coupled to the signal source, the first optical die being flip-chip bonded to a substrate and defining a first volume between the first optical die and the substrate, the first optical die including an optically active area on a surface of the die facing the substrate;

a signal destination;

a second optical die coupled to the signal destination, the second optical die being flip-chip bonded to a substrate and defining a second volume between the second optical die and the substrate, the second optical die including an optically active area on a surface of the die facing the substrate;

an optical component extending between the first and second optical dies, the

optical component partially positioned in the first and second volumes;

an optically transparent material occupying those portions of the first and second volumes substantially in the optical paths of the optically active areas and the optical component; and

an opaque underfill material positioned in the first and second volumes,

the opaque underfill material occupying portions of the volumes not occupied by the optically transparent material.

20. Pertaining to claim 20, Chason teaches the system of claim 19 wherein the optical component is a waveguide.

21. Pertaining to claim 21, Chason teaches the system of claim 19 wherein the optically active area of the first die is a source and the optically active area of the second die is a detector.

22. Pertaining to claim 22, Chason teaches the system of claim 19 wherein the optically transparent material has a refractive index substantially the same as a refractive index of the optical component.

23. Pertaining to claim 23, Chason teaches the system of claim 19 wherein the optically transparent material has a refractive index of approximately 1.5.

24. Pertaining to claim 24, Chason teaches the system of claim 19 wherein the optically transparent material has a low modulus of elasticity.

25. Pertaining to claim 25, Chason teaches the system of claim 19 wherein the optically transparent material is optically transparent at wavelengths between 800 nm and 1550 nm.

26. Pertaining to claim 26, Chason teaches the system of claim 25 wherein the optically transparent material is optically transparent at a wavelength of approximately 850 nm.

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Claim Rejections - 35 USC § 103

27. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

28. Claims 6, 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chason et al., U.S. Patent Application Publication US 2004/0118599 A1.

29. Chason fails to teach a specific refractive index of 1.5. Given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved. See *In re Aller, Lacey and Hall* (10 USPQ 233-237) "It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of either the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

30. An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

32. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

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34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

35. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



W. David Coleman
Primary Examiner
Art Unit 2823

WDC